



Entrez PubMed Nucleotide Protein Genome Structure OMIM PMC Journals Books

Search PubMed for [] Go Clear

Limits Preview/Index History Clipboard Details

Display Abstract Show: 20 Sort Send to Text

About Entrez

Text Version

1: Microbiology. 2002 May;148(Pt 5):1291-303.

Related Art

Entrez PubMed

Overview

Help | FAQ

Tutorial

New/Noteworthy

E-Utilities

PubMed Services

Journals Database

MeSH Database

Single Citation Matcher

Batch Citation Matcher

Clinical Queries

LinkOut

Cubby

Related Resources

Order Documents

NLM Catalog

NLM Gateway

TOXNET

Consumer Health

Clinical Alerts

ClinicalTrials.gov

PubMed Central

FREE full text article at
mic.sgmjournals.org

The ARO4 gene of *Candida albicans* encodes a tyrosine-sensitive DAHP synthase: evolution, functional conservation and phenotypic Aro3p-, Aro4p-deficient mutants.

Sousa S, McLaughlin MM, Pereira SA, VanHorn S, Knowlton R, Brown Nicholas RO, Livi GP.

Department of Comparative Genomics, Glaxo SmithKline, King of Prussia, PA 19406, USA.

The enzyme 3-deoxy-D-arabinoheptulosonate-7-phosphate (DAHP) synthase catalyses the first step in aromatic amino acid biosynthesis in prokaryotes, plants and fungi. Cells of *Saccharomyces cerevisiae* contain two catalytically redundant synthases, encoded by the genes ARO3 and ARO4, whose activities are feedback inhibited by phenylalanine and tyrosine, respectively. ARO3/4 gene transcription is controlled by GCN4. The authors previously cloned an ARO3 gene orthologue from *Candida albicans* and found that: (1) it can complement an aro3 aro4 double deletion in *S. cerevisiae*, an effect inhibited by excess phenylalanine, and (2) a homozygous aro3-deletion mutant of *C. albicans* is phenotypically Aro(+), suggesting the presence of another isozyme(s). They now report the identification and functional characterization of the *C. albicans* orthologue of *S. cerevisiae* Aro4p. The two enzymes share 68% amino acid identity. Phylogenetic analysis places the fungal DAHP synthases in a cluster separate from prokaryotic orthologues and suggests ARO3 and ARO4 arose from a single gene via a gene duplication event early in fungal evolution. *C. albicans* ARO4 mRNA is elevated upon amino acid starvation, consistent with the presence of three putative Gcn4p-responsive elements (G-boxes) in the gene promoter sequence. *C. albicans* ARO4 complements an aro3 aro4 double deletion in *S. cerevisiae*, an effect inhibited by excess tyrosine. The authors engineered Deltaaro3/Deltaaro3 Deltaaro4/MET3p::ARO4 cells of *C. albicans* and found that they fail to grow in the absence of aromatic amino acids when expression is repressed, and that this growth defect can be partially rescued by aromatic amino acids and certain aromatic amino acid pathway intermediates. They concluded that, like *S. cerevisiae*, *C. albicans* contains two DAHP synthases for the first step in the aromatic amino acid biosynthetic pathway.

PMID: 11988503 [PubMed - indexed for MEDLINE]